The right place in the right space? Awareness of site for needle thoracocentesis

E P Ferrie, N Collum, S McGovern

Background: Invasive practical procedures require identification of surface anatomical landmarks to reduce risk of damage to other structures. Needle thoracocentesis has specific complications, which have been previously documented. An observational study was performed among emergency physicians to name the landmark for needle thoracocentesis and identify this point on a human volunteer as per Advanced Trauma and Life Support (ATLS) guidelines. Results: A cohort of 25 emergency physicians were included: six senior house officers, five staff grades, six specialist registrars, and eight consultants. Twenty two of the participants had completed ATLS training within the previous 10 years. The other four were senior house officers who had no formal ATLS teaching but were assumed to be aware of the procedure given the speciality they were working in. Twenty two (88%, with 95% confidence interval (CI) 69 to 95%) of the participants named the landmark as 2ICS MCL. Fifteen of the 25 (60%, with 95% CI 39 to 79%) were able to correctly identify the second intercostal space on the human volunteer. The correct landmark was named by 22 (88%). Only 15 (60%) correctly identified the second intercostal space on the human volunteer, all placing the needle medial to the midclavicular line, with a range of 3 cm. Two (8%) named and identified the site of needle pericardiocentesis; one (4%) named and identified the fifth intercostal space in the anterior axillary line. Discussion: These results demonstrate a low accuracy among emergency physicians in identifying correct landmarks for needle thoracocentesis under elective conditions. Should greater emphasis be placed on competency based training in ATLS?

RESULTS

Twenty five emergency physicians were included: six senior house officers, five staff grades, six specialist registrars, and eight consultants. Twenty two of the participants had completed ATLS training within the previous 10 years. The other four were senior house officers who had no formal ATLS teaching but were assumed to be aware of the procedure given the speciality they were working in.

Twenty two (88%, with 95% confidence interval (CI) 69 to 95%) of the participants named the landmark as 2ICS MCL. Fifteen of the 25 (60%, with 95% CI 39 to 79%) were able to correctly identify the second intercostal space on the volunteer. Four (16%) incorrectly identified the first intercostal space and four (16%) identified the third intercostal space. Altogether, 21 of the 22 (95%) points were placed medial to the midclavicular line. One (4%) named and identified the fifth intercostal space, anterior axillary line and two (8%) named and identified “below and lateral to the xiphisternum” as the landmark.

Of the 14 who correctly identified the second intercostal space, 12 (86%) were positioned in the lower half of the intercostal space.

Following statistical analysis with two sided χ² tests and Fishers exact test, there was no significant difference between correct identification of the landmark and seniority of participant, nor correct identification and ATLS status. Because of the small sample size, however, this study would not have been sufficiently powered to fully explore these secondary end points. Results are summarised in fig 1.

DISCUSSION

The primary aim of this study was to describe the relation between knowledge of the preferred site of needle thoracocentesis and the ability to correctly identify this point on a human volunteer.

Abbreviations: ATLS, Advanced Trauma Life Support
One of the limitations of this study was the small sample size, from which it was difficult to draw statistical significance, although it highlights important issues that impact on clinical practice. The use of a single human volunteer was an attempt to standardise the testing procedure; however, a range of volunteers may have given more useful results.

Needle thoracocentesis for decompression of a tension pneumothorax is life saving, but is associated with potentially serious complications. Care must be taken in identifying surface landmarks to minimise the risk involved. A greater emphasis on competency based training should assist in achieving this.

**Authors’ affiliations**

E P Ferrie, N Collum, S McGovern, Ulster Hospital Dundonald, Ulster, Northern Ireland

Competing interests: none declared

“The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, an exclusive licence (or non exclusive for government employees) on a worldwide basis to the BMJ Publishing Group Ltd to permit this article (if accepted) to be published in EMJ and any other BMJ/PL products and sublicences such use and exploit all subsidiary rights, as set out in our licence (http://emj.bmjournals.com/misc/ifora/licenceform.shtml).”

**REFERENCES**

The right place in the right space? Awareness of site for needle thoracentesis

E P Ferrie, N Collum and S McGovern

doi: 10.1136/emj.2004.015107

Updated information and services can be found at:
http://emj.bmj.com/content/22/11/788

These include:

References
This article cites 13 articles, 2 of which you can access for free at:
http://emj.bmj.com/content/22/11/788#BIBL

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/